

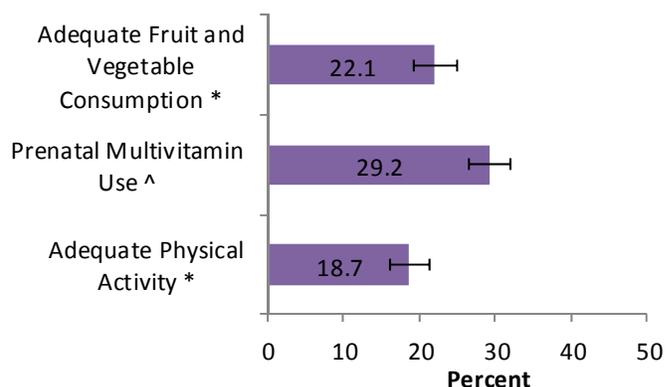
# Preconception Health in Michigan

## Nutrition and Physical Activity

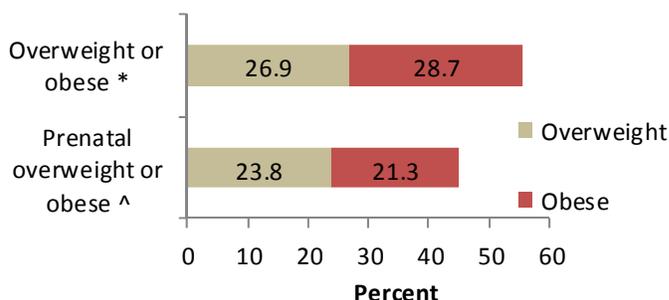
### Women's Health: Summary



**Figure 1:** Prevalence of women aged 18-44 years with self-reported **positive indicators**, or those which would ideally increase over time with improved health; 2011 MIBRFSS and 2010 MI PRAMS.



**Figure 2:** Prevalence of women aged 18-44 years with self-reported **negative indicators**, or those which would ideally decrease over time with improved health; 2011 MI BRFSS and 2010 MI PRAMS.



#### Summary of Key Points *(2010 MI-PRAMS and 2011 MI-BRFSS data presented in these factsheets)*

- **Most women aged 18-44 years did not have adequate fruit and vegetable consumption, prenatal multivitamin use, or physical activity**
- **While prenatal multivitamin use was achieving and exceeding the HP 2020 Goal, several significant disparities were evident based on age, race, health insurance status, educational attainment, and household income**
- **The total prevalence of adequate physical activity did not achieve the HP 2020 Goal, and significant disparities were evident based on race, health insurance status, educational attainment, and household income**
- **Over 46% of Michigan women were overweight (23.8%) or obese (21.3%) at the time they became pregnant**
- **The prevalence of prenatal obesity was higher among black women compared to white women**

\* MI-BRFSS: women aged 18-44 years

^ MI-PRAMS: women aged 18-44 years having a live birth

# Preconception Health in Michigan

## Nutrition and Physical Activity

### Overview of Preconception Health

#### Why is Preconception Health Important?



Preconception health refers to the health and well-being of women prior to becoming pregnant either for the first time or with subsequent pregnancies. Improving the

preconception health of women can improve maternal and infant health outcomes.<sup>1,2,3</sup>

Preconception health encompasses biomedical, behavioral, and social factors. In 2010, nearly 45% of Michigan mothers delivering live births reported that the pregnancy was unintended (PRAMS data). Additionally, many women do not seek prenatal care until eight weeks of gestation or later, at which time the period that carries the highest risk for the fetus has already passed.<sup>3</sup> Education and awareness of improved health of all women of reproductive age can help improve future pregnancy outcomes.

#### Preconception Health Indicators



A national committee of state program leaders and epidemiologists has identified broad health domains related to preconception health, and has proposed specific

health indicators based on currently measurable data for women of reproductive age.<sup>2</sup> Indicators are used to monitor public health status and help assess progress toward national and state goals. The information in these factsheets encompasses the Nutrition and Physical Activity Domain:

- Fruit and Vegetable Consumption
- Folic Acid Supplementation
- Overweight and Obesity
- Exercise and Physical Activity

For information regarding data sources, please reference the “Preconception Health in Michigan: Nutrition and Physical Activity” factsheet subtitled “Data Sources.”

#### Healthy People 2020 Goals



The Healthy People 2020 (HP 2020) Goals are a set of science-based goals created by a national multi-disciplinary group with the objective of improving the health and well-being of all people in the United States.<sup>3</sup> In the factsheets, the HP 2020 Goal is represented by a dashed line and an arrow demonstrating whether it is more desirable to be above or below the goal.

#### References

1. Centers for Disease Control and Prevention. Recommendations to improve preconception health and health care—United States. *MMWR* 2006; 55 (RR06):1-23
2. Broussard DL, et al. Core state preconception health indicators: a voluntary, multi-state selection process. *Matern. Child Health J.* 2011; 15(2):158-168.
3. United States Department of Health and Human Services. “Healthy People 2020.” 2013. Available online: <http://www.healthypeople.gov/2020/default.aspx>. Accessed May 10, 2013.

#### Suggested Citation

Vanos H, Larder C, Fussman C, McKane P, Wahl R. Michigan Department of Community Health. “Preconception Health in Michigan: Nutrition and Physical Activity.” 2013.

# Preconception Health in Michigan

## Nutrition and Physical Activity

### Fruit and Vegetable Consumption

**Overview:** Low birth weight and prematurity are associated with maternal dietary inadequacy before becoming pregnant. The diets of mothers with low birth weight infants are frequently deficient in fruits and vegetables.<sup>1</sup> Fruits and vegetables are important sources of vitamins, including folic acid and Vitamin A, which are essential for healthy fetal development. Growth of the placenta and fetus is most susceptible to the effects of maternal nutrition during the pre-implantation period through the first few weeks of gestation.<sup>2</sup> Typically, this occurs before pregnancies are confirmed. Women of reproductive age, especially those planning to become pregnant, can maximize future pregnancy health by eating a well balanced diet including fruits, vegetables, and foods containing calcium, protein, iron, Vitamin C, and folic acid.<sup>2</sup>

**Preconception Health Indicator:** Percentage of women aged 18-44 years who consume fruits (including juice) and vegetables at least 5 times per day

**HP 2020 Goal:** Increase the contribution of fruits and vegetables to the diets of the population aged 2 years and older

**Key Points** (MI-BRFSS, 2011)

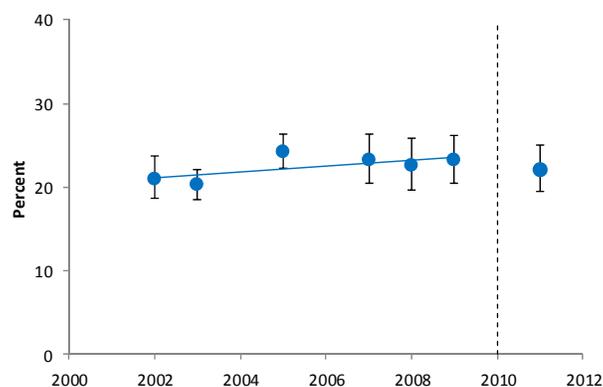
- Most women aged 18-44 years did not have adequate fruit and vegetable consumption
- Although disparities in the data were evi-

dent, none achieved  
statistical significance



**Trends Over Time:** Prevalence has slightly increased over the years of 2002-2009

**Figure 1:** Prevalence of women aged 18-44 years with self-reported **adequate fruit and vegetable consumption<sup>a</sup>** by year, 2002-2011 Michigan BRFSS.



Due to BRFSS methodology changes, 2011 BRFSS estimates cannot be compared to BRFSS estimates from previous years.

<sup>a</sup>Consumption of fruits (including juice) and vegetables at least 5 times per day

#### References

1. Brundage SC. Preconception health care. *Am. Fam. Physician* 2002; 65(12):2507-2515
2. Gardiner PM, Nelson L, et al. The clinical content of preconception care: nutrition and dietary supplements. *Am. J. Obstet. Gynecol.* 2008; 199(6 suppl 2):s345-56

#### Suggested Citation

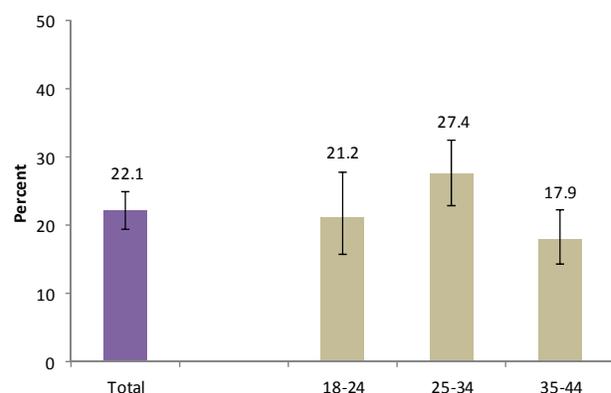
Vanos H, Larder C, Fussman C, McKane P, Wahl R. Michigan Department of Community Health. "Preconception Health in Michigan: Nutrition and Physical Activity." 2013.

# Preconception Health in Michigan

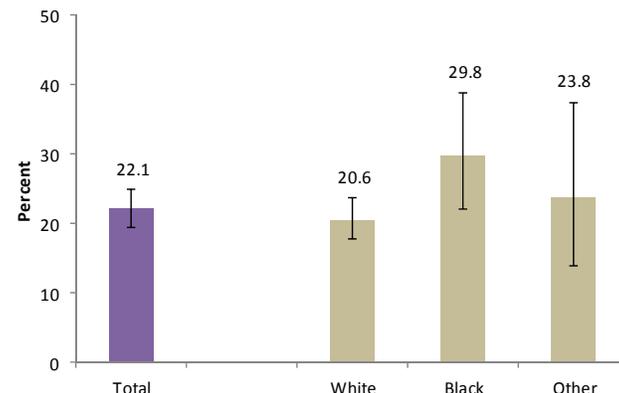
## Nutrition and Physical Activity

### Fruit and Vegetable Consumption

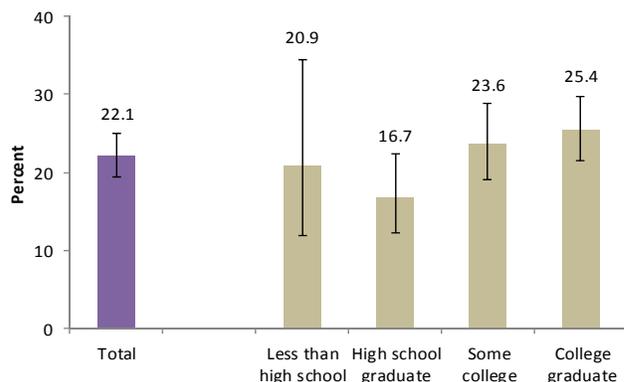
**Figure 2:** Prevalence of women aged 18-44 years with self-reported **adequate fruit and vegetable consumption**<sup>a</sup> by age group, 2011 MI-BRFSS



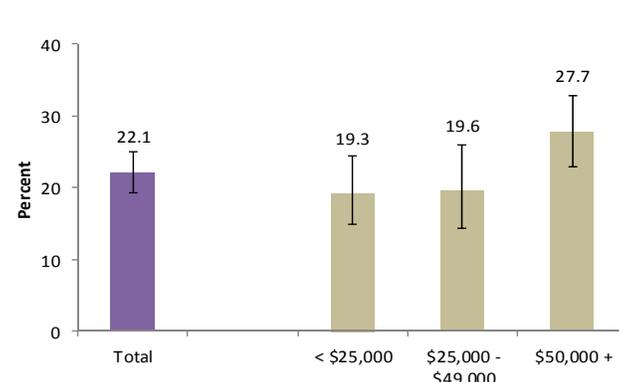
**Figure 3:** Prevalence of women aged 18-44 years with self-reported **adequate fruit and vegetable consumption**<sup>a</sup> by race, 2011 MI-BRFSS



**Figure 4:** Prevalence of women aged 18-44 years with self-reported **adequate fruit and vegetable consumption**<sup>a</sup> by educational attainment, 2011 MI-BRFSS



**Figure 5:** Prevalence of women aged 18-44 years with self-reported **adequate fruit and vegetable consumption**<sup>a</sup> by household income, 2011 MI-BRFSS



<sup>a</sup>Consumption of fruits (including juice) and vegetables at least 5 times per day

HP 2020 Goal: Increase the contribution of fruits and vegetables to the diets of the population aged 2 years and older

# Preconception Health in Michigan

## Nutrition and Physical Activity

### Folic Acid Supplementation

**Overview:** Maternal nutrition in the preconception period and during pregnancy is critically important for fetal development.<sup>1</sup> There is a considerable amount of evidence that synthetic folic acid supplementation in the preconception period and early gestation has protective mechanisms against several congenital malformations,<sup>1,2,3</sup> and is also associated with decreased risk for low birth weight and small for gestational age.<sup>1</sup> With dietary supplementation, certain congenital malformations called neural tube defects (such as spina bifida) can be decreased by 60-70%.<sup>3,4</sup> Folate is important for the synthesis of DNA and protein, and for regulation of DNA expression.<sup>2</sup> For optimal protective effects, it is recommended that women begin folic acid supplementation at least three months prior to conception.<sup>4</sup>

**Preconception Health Indicator:** Percentage of women aged 18-44 years having a live birth who took a multivitamin or prenatal vitamin daily during the month before conception

**Healthy People 2020 Goal:** Increase the proportion of women delivering a live birth who took a multivitamin/folic acid prior to pregnancy to **33.1%**

**Key Points** (MI-PRAMS, 2010)

- **Most women aged 18-44 did not have adequate folic acid supplementation one month prior to conception**

- **Prevalence of folic acid supplementation was lower than the HP 2020 Goal in women:**

- **Aged 18-24 years**
- **Who were Black**
- **Enrolled in Medicaid or with no health insurance**
- **With low educational attainment**
- **With low household income**



**Trends Over Time:** Prevalence has been constant and consistently achieving and exceeding the HP 2020 Goal over the years of 2004-2010.

#### References

1. Timmermans S, et al. Periconception folic acid supplementation, fetal growth and the risks of low birth weight and preterm birth: the Generation R study. *Brit. J. Nutr.* 2009;;102(5):777-785.
2. Boxmeer JC, et al. Preconception folic acid treatment affects the microenvironment of the maturing oocyte in humans. *Fertil. Steril.* 2008; 89(6):1766-1770.
3. Persad VL, et al. Incidence of open neural tube defects in Nova Scotia after folic acid fortification. *Can. Med. Assoc. J.* 2002; 167(3):241-245.
4. Centers for Disease Control and Prevention. Recommendations to improve preconception health and health care—United States. *MMWR* 2006; 55 (RR06):1-23

#### Suggested Citation

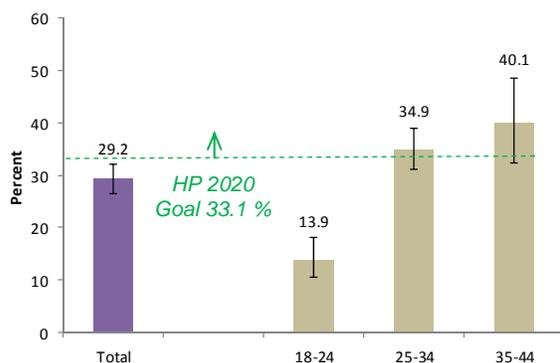
Vanos H, Larder C, Fussman C, McKane P, Wahl R. Michigan Department of Community Health. "Preconception Health in Michigan: Nutrition and Physical Activity." 2013.

# Preconception Health in Michigan

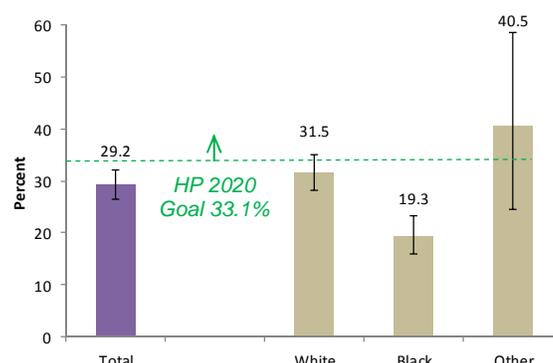
## Nutrition and Physical Activity

### Folic Acid Supplementation

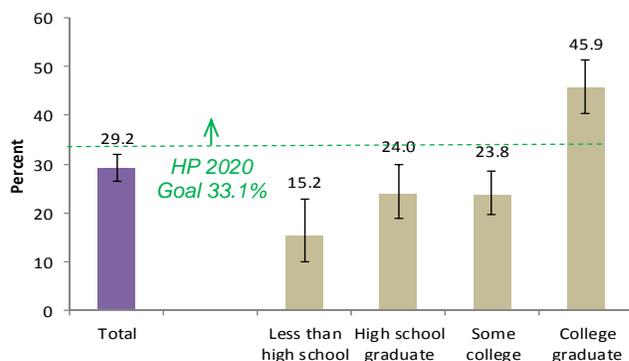
**Figure 1:** Prevalence of women aged 18-44 years having a live birth with self-reported **pre-pregnancy multivitamin or prenatal vitamin use<sup>a</sup>** by age group, 2010 MI-PRAMS



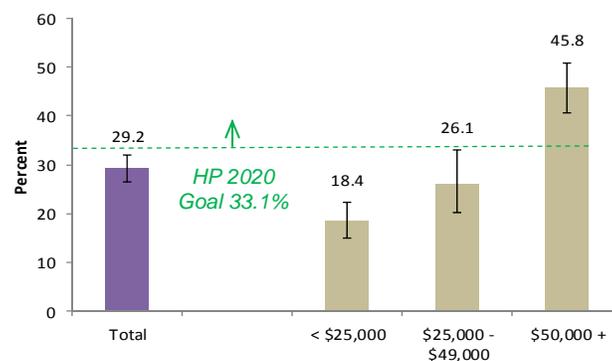
**Figure 2:** Prevalence of women aged 18-44 years having a live birth with self-reported **pre-pregnancy multivitamin or prenatal vitamin use<sup>a</sup>** by race, 2010 MI-PRAMS



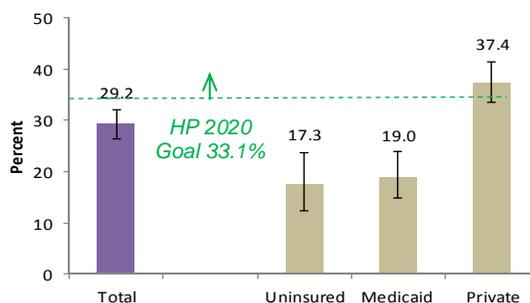
**Figure 3:** Prevalence of women aged 18-44 years having a live birth with self-reported **pre-pregnancy multivitamin or prenatal vitamin use<sup>a</sup>** by educational attainment, 2010 MI-PRAMS



**Figure 4:** Prevalence of women aged 18-44 years having a live birth with self-reported **pre-pregnancy multivitamin or prenatal vitamin use<sup>a</sup>** by household income, 2010 MI-PRAMS



**Figure 5:** Prevalence of women aged 18-44 years having a live birth with self-reported **pre-pregnancy multivitamin or prenatal vitamin use<sup>a</sup>** by health insurance, 2010 MI-PRAMS



<sup>a</sup>Consumption of a multivitamin or prenatal vitamin daily for one month prior to conception. This is an estimation of folic acid intake.

# Preconception Health in Michigan

## Nutrition and Physical Activity

### Overweight and Obesity

**Overview:** In the past 20 years, the prevalence of obesity in pregnant women and women of reproductive age has increased in many high-income countries.<sup>1</sup>

Maternal overweight has been associated with increased risk of cesarean section and post-operative complications for those deliveries, gestational diabetes, and hypertension. Infants of overweight mothers are more likely to be admitted to neonatal intensive care units compared to normal-weight mothers.<sup>2</sup>

In obese women, stillbirth is nearly twice as likely compared to normal-weight women.<sup>1</sup> Maternal obesity has been associated with numerous other poor perinatal outcomes, including preterm delivery, cesarean section, heart defects, neural tube defects, macrosomia (excessive birth weight), low Apgar scores, perinatal mortality, gestational diabetes, hypertension and preeclampsia, and thromboembolic disease.<sup>1,2,3</sup> These risks can be decreased with appropriate weight loss and nutrition in the preconception period.<sup>3</sup>



**Preconception Health Indicator:** Percentage of women aged 18-44 years with a Body Mass Index (BMI; weight in kg/height in m<sup>2</sup>)  $\geq 25$  but  $< 30$  (overweight) or BMI  $\geq 30$  (obese)

**Healthy People 2020 Goal:** Reduce the proportion of adults who are obese to **30.6%**

**Key Points** (MI-PRAMS, 2010)

- **Over 46% of Michigan women aged 18-44 years having a live birth were classified as either overweight<sup>a</sup> (23.8%) or obese<sup>b</sup> (22.6%) at the time they became pregnant**
- **The prevalence of prenatal obesity was higher among Black women compared to White women**

<sup>a</sup>BCS  $\geq 25$  and  $< 30$  based on self-reported height and weight

<sup>b</sup>BCS  $\geq 30$  based on self-reported height and weight

**Trends Over Time:** Prevalence of prenatal overweight and obesity has been constant over the years of 2004-2010, and obesity has achieved (remained below) the HP 2020 Goal.

#### References

1. Vasudevan C, Renfrew M, McGuire W. Fetal and perinatal consequences of maternal obesity. *Arch. Dis. Child Fetal Neonatal Ed.* 2011; 96(F):378-382
2. Galtier-Dereure F, Boegner C, Bringer J. Obesity and pregnancy: complications and cost. *Am. J. Clin. Nutr.* 2000; 71(5):1242s-1248s.
3. Centers for Disease Control and Prevention. Recommendations to improve preconception health and health care—United States. *MMWR* 2006; 55 (RR06):1-23

#### Suggested Citation

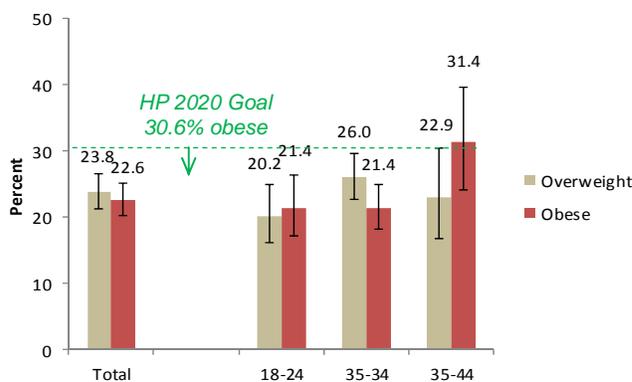
Vanos H, Larder C, Fussman C, McKane P, Wahl R. Michigan Department of Community Health. "Preconception Health in Michigan: Nutrition and Physical Activity." 2013.

# Preconception Health in Michigan

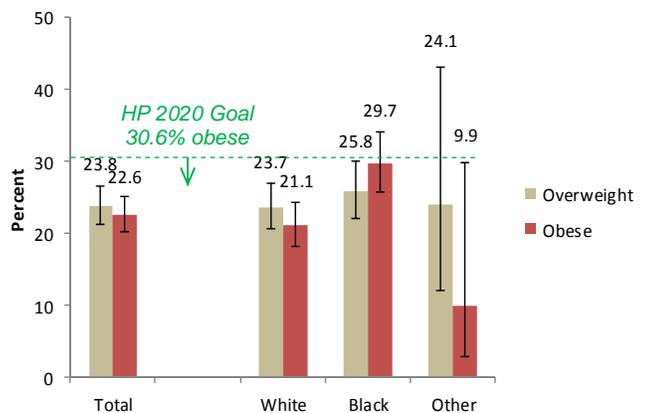
## Nutrition and Physical Activity

### Overweight and Obesity

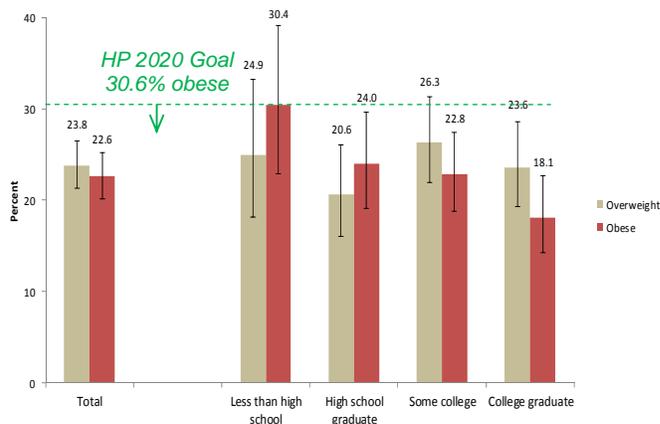
**Figure 1:** Prevalence of women aged 18-44 years having a live birth who were **overweight<sup>a</sup>** or **obese<sup>b</sup>** at the time they became pregnant by age group, 2010 MI-PRAMS



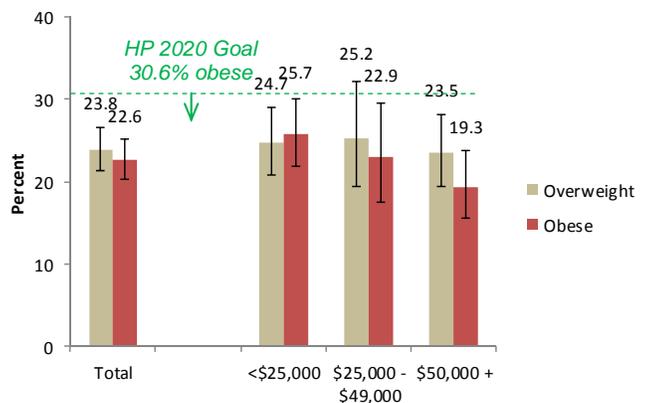
**Figure 2:** Prevalence of women aged 18-44 years having a live birth who were **overweight<sup>a</sup>** or **obese<sup>b</sup>** at the time they became pregnant by race, 2010 MI-PRAMS



**Figure 3:** Prevalence of women aged 18-44 years having a live birth who were **overweight<sup>a</sup>** or **obese<sup>b</sup>** at the time they became pregnant by educational attainment, 2010 MI-PRAMS



**Figure 4:** Prevalence of women aged 18-44 years having a live birth who were **overweight<sup>a</sup>** or **obese<sup>b</sup>** at the time they became pregnant by household income, 2010 MI-PRAMS



<sup>a</sup>BCS  $\geq 25$  and  $< 30$  based on self-reported height and weight; <sup>b</sup>BCS  $\geq 30$  based on self-reported height and weight

# Preconception Health in Michigan

## Nutrition and Physical Activity

### Exercise and Physical Activity

**Overview:** Physical activity can help individuals maintain a healthy weight, and can also impact several other aspects of health. It can help lower blood pressure, reduce the risk for heart attack, stroke, type 2 diabetes, several forms of cancer, and osteoporosis, and reduce symptoms of depression and anxiety.<sup>1</sup>

Physical activity during the preconception period has been associated with decreased risk of gestational diabetes.<sup>2,3,4</sup> Gestational diabetes has been associated with a predisposition to postpartum type 2 diabetes in mothers.<sup>2</sup> Additionally, gestational diabetes and glucose intolerance



during pregnancy can increase risk of cesarean section, childhood obesity, and diabetes in children and young adults.<sup>3,4</sup>

#### **Preconception Health Indicator:**

Among women aged 18-44 years who participate in leisure-time physical activity, the percentage who engage in either moderate physical activity for 150+ minutes per week or vigorous physical activity for 75+ minutes per week, or an equivalent combination of the two

#### **Healthy People 2020 Goal:**

Increase the proportion of adults who engage in aerobic physical activity of at least moderate intensity for 150+ minutes per week, or 75+

minutes per week of vigorous intensity, or an equivalent combination, **and** also participate in muscle strengthening activities on two or more days per week, to **20.1%**.

#### **Key Points** (MI-BRFSS, 2011)

- **Most women aged 18-44 years did not have adequate physical activity**
- **Prevalence of adequate physical activity was significantly lower than the HP 2020 Goal in women:**

- **Who were Black**
- **With no health insurance**
- **With low educational attainment**
- **With low household income**

#### **References**

1. Centers for Disease Control and Prevention. "Healthy weight—it's not a diet, it's a lifestyle!" 2011. Available online: [http://www.cdc.gov/healthyweight/physical\\_activity/index.html](http://www.cdc.gov/healthyweight/physical_activity/index.html). Accessed May 13, 2013.
2. Retnakaran R, et al. Pre-gravid physical activity and reduced risk of glucose intolerance in pregnancy: the role of insulin sensitivity. *Clin. Endocrinol.* 2009; 70 (4):615-622
3. Baptiste-Roberts K, Ghosh P, Nicholson WK. Pregravid physical activity, dietary intake, and glucose intolerance during pregnancy. *J. Womens Health* 2011; 20(12):1847-1851
4. Tobias DK, et al. Physical activity before and during pregnancy and risk of gestational diabetes mellitus: a meta-analysis. *Diabetes Care* 2011; 34(1):223-229

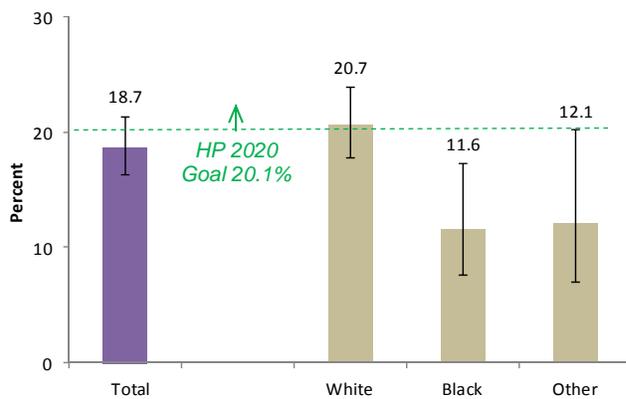
**Suggested Citation** Vanos H, Larder C, Fussman C, McKane P, Wahl R. Michigan Department of Community Health. "Preconception Health in Michigan: Nutrition and Physical Activity." 2013.

# Preconception Health in Michigan

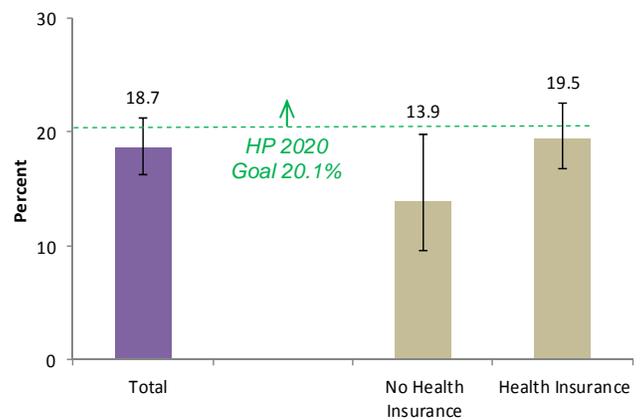
## Nutrition and Physical Activity

### Exercise and Physical Activity

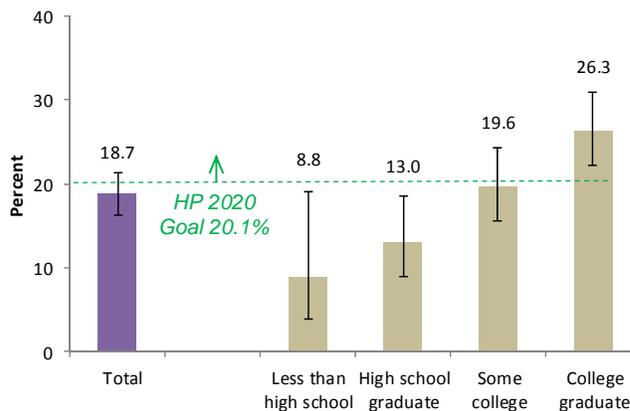
**Figure 1:** Prevalence of women aged 18-44 years who participated in **adequate aerobic physical activity<sup>a</sup>** by race, 2011 MI-BRFSS



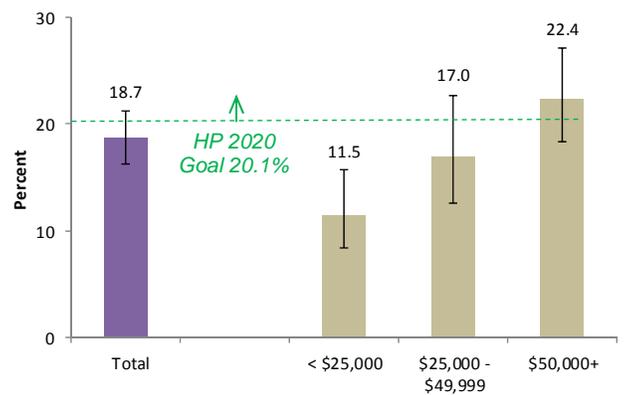
**Figure 2:** Prevalence of women aged 18-44 years who participated in **adequate aerobic physical activity<sup>a</sup>** by health insurance, 2011 MI-BRFSS



**Figure 3:** Prevalence of women aged 18-44 years who participated in **adequate aerobic physical activity<sup>a</sup>** by educational attainment, 2011 MI-BRFSS



**Figure 4:** Prevalence of women aged 18-44 years who participated in **adequate aerobic physical activity<sup>a</sup>** by household income, 2011 MI-BRFSS



<sup>a</sup>Either moderate physical activity for 150+ minutes per week or vigorous physical activity for 75+ minutes per week, or an equivalent combination of the two, **and** muscle strengthening activities on two or more days per week (of those reporting leisure physical activity)



# Preconception Health in Michigan

## Nutrition and Physical Activity

### Data Sources

#### **Michigan Behavior Risk Factor Surveillance System (MI-BRFSS)**



BRFSS is a joint effort of the CDC and state health departments, and is available in all 50 states. It is a telephone health survey of adults aged 18 years and older, whom are selected by random-digit dialing.<sup>1</sup> BRFSS methodology recently changed to include cell phone only respondents.<sup>2</sup> BRFSS serves as a data source regarding health risk behaviors, preventive health practices, and health care access. Data are all self-reported, so this surveillance method is subject to recall bias as people may not remember previous behaviors or health conditions. However, BRFSS is regarded as having moderate to high validity (accuracy).<sup>1</sup>

#### **Michigan Pregnancy Risk Assessment Monitoring System (MI-PRAMS)**



PRAMS is a joint effort of the CDC and state health departments, and is available in 40 states and New York City.<sup>3</sup> It is a mailed questionnaire sent to a stratified, random sample of women with a live birth in the previous 2-6 months<sup>3</sup>, gathering data on maternal attitudes, experiences, health behaviors and conditions, and health care access.<sup>1</sup> Telephone follow-up is conducted for women who do not

respond by mail. Data are self-reported and subject to recall bias.<sup>1</sup> However, yearly findings can be applied to 98% of residents who deliver a live birth in Michigan.<sup>4</sup>



#### **References**

1. Broussard DL, et al. Core state preconception health indicators: a voluntary, multi-state selection process. *Matern. Child Health J.* 2011; 15(2):158-168.
2. Centers for Disease Control and Prevention. "BRFSS 2011 Survey Data and Documentation." 2013. Available online: [http://www.cdc.gov/brfss/annual\\_data/annual\\_2011.htm](http://www.cdc.gov/brfss/annual_data/annual_2011.htm). Accessed May 21, 2013.
3. Larder C, MI PRAMS Epidemiologist. Personal communication, May 14, 2013.
4. Grigorescu et al. Preconception Health Assessment Work Group. "Preconception Health in Michigan." 2011.

#### **Suggested Citation**

Vanos H, Larder C, Fussman C, McKane P, Wahl R. Michigan Department of Community Health. "Preconception Health in Michigan: Nutrition and Physical Activity." 2013.